Economics Letters 144 (2016) 10–14

Contents lists available at ScienceDirect

Economics Letters

journal homepage: www.elsevier.com/locate/ecolet

On the determinants of political polarization

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HIGHLIGHTS

- We study the determinants of political polarization using a BMA approach.
- Trust and income inequality are robust determinants of political polarization.
- Higher trust decreases political polarization.
- Higher income inequality increases political polarization.

ARTICLE INFO

Article history:
Received 3 November 2015
Received in revised form
13 April 2016
Accepted 17 April 2016
Available online 22 April 2016

JEL classification:
D63
D72
P5
Z13

Keywords:
Political polarization determinants
Model uncertainty
Bayesian model averaging

ABSTRACT

In this article, we aim to identify the main determinants of political polarization using Bayesian Model Averaging to overcome the problem of model uncertainty. We find that the level of trust within a country and the degree of income inequality are the most robust determinants of political polarization.

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1. Introduction

Political polarization has a major influence on economic performance and has been shown to significantly affect investment rates (Azzimonti, 2011), fiscal policy (Lindqvist and Östling, 2010; Song, 2012), legislative productivity (Hacker, 2004; McCarty et al., 2006), macroeconomic volatility (Alt and Lassen, 2006; Azzimonti and Talbert, 2014), income inequality (McCarty et al., 2006), and, eventually, the development path of the economy (Frye, 2002). Political polarization reflects the degree of the divergence of attitudes toward political matters in a society and might in turn depend on the evolution of economic outcomes. Whether political polarization is a historical, cultural, or economic phenomenon is an empirical question.

In this paper, we address this question by studying the determinants of political polarization in a sample of 66 countries. Given that little is known about the main underlying factors that affect political polarization, we use the Bayesian Model Averaging (BMA) method of estimation to account for model uncertainty. To estimate political polarization, we use measures based on voters' self-reported political preferences as constructed by Lindqvist and Östling (2010). We extend their variables to include more countries, relying on data from the World Values Survey. We consider three groups of potential explanatory variables: economic, socio-historical, and geographic. The variables are selected from related discussions in the political science literature.

We find that the most robust determinants of political polarization are trust and income inequality in a country. A lower level of trust and higher income inequality contribute to higher political polarization. This implies that political polarization is a socio-historical and an economic phenomenon.

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http://dx.doi.org/10.1016/j.econlet.2016.04.018
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2. Data

2.1. The measures of political polarization

We construct the political polarization measures using data from the World Values Survey (WVS).[1] The WVS consists of nationally representative surveys conducted in waves once every five years, on average, using a common questionnaire, and includes about 1000 respondents per country-wave. We include countries from different survey waves to maximize the number of observations. Thus, we use information from five waves of this survey covering the time period 1990–2013, for 66 countries for which all necessary data is available.

For each wave and for each country in the sample, we construct the political polarization measures by computing the standard deviation of the scores the responders assign in response to the question "How would you place your views on this scale [from 1 to 10]?" for the following statements:

1. 1 means that you completely agree with the statement, "People should take more responsibility to provide for themselves", and 10 means that you completely agree with the statement, "The government should take more responsibility to ensure that everyone is provided for".
2. 1 means that you completely agree with the statement, "Incomes should be made more equal", and 10 means that you completely agree with the statement, "We need larger income differences as incentives".
3. 1 means that you completely agree with the statement, "Private ownership of business should be increased", and 10 means that you completely agree with the statement, "Government ownership of business should be increased".

These questions reflect attitudes to different policy problems: government spending, income inequality, and private–state ownership. We denote the respective polarization measures as GOV, ININ, and PRST; their descriptive statistics are reported in Table 1.

2.2. Potential determinants of political polarization

We distinguish three groups of potential determinants of political polarization: economic, socio-historical, and geographic. Below we describe each potential determinant of political polarization in detail.

Economic determinants

1. **The real gross domestic product (GDP) per capita**. We want to study whether political polarization is (at least partially) determined by a country's economic conditions. The GDP is the most common measure of economic performance and has been shown to be a significant factor promoting the emergence of democratic political institutions (see Londregan and Poole, 1996). We expect higher GDP to decrease political polarization. Data Source: World Bank.

2. **Income inequality**. This variable is the most frequently discussed correlate of political polarization in the literature (see Garand, 2010; Londregan and Poole, 1996; McCarty et al., 2006; Pontusson and Rueda, 2008, among others). We consider the Gini coefficient after redistribution as the measure of income inequality. Data Source: World Income Inequality Database.

3. **Globalization**. Similar to GDP, globalization, or the openness of a country to foreign capital flows, is a proxy for economic development. Globalization can be affected by political frictions within a country, and can influence the evolution of political frictions. We measure globalization as the foreign direct investment share of the GDP. Data Source: Sturm and De Haan (2015).

4. **Government expenditure** (**% of GDP**). The size of the public sector depends on political frictions, in particular, on political polarization (Lindqvist and Östling, 2010). However, government expenditures can affect the evolution of political attitudes in society. A government that spends a significant fraction of its revenues on public goods, such as schools or medical care, can improve the overall social attitude toward politicians in society and decrease political polarization. We use the general government final consumption expenditure. Data Source: World Bank.

Socio-historical determinants

5. **Media status**. The degree of proliferation, independence, and overall quality of the media can have a nontrivial effect on political polarization in a country through a direct influence on public opinion. Bernhardt et al. (2008), DellaVigna and Kaplan (2007), Gerber et al. (2009), and Prior (2013) study the relationship between the media and political polarization. As a measure of media quality, we use the indicator of freedom of the press, defined as follows: (1) free, (2) partly free, and (3) not free. Data source: Freedom House.

6. **Ethnolinguistic fractionalization**. This variable accounts for cultural diversity, which can influence the distribution of attitudes to political matters. Esteban and Ray (2011) consider fractionalization and inequality as proxies for polarization and determinants of conflict in a country. Data source: We use the ethnolinguistic fractionalization measure constructed by Desmet et al. (2012), variable ELF(1).

7. **Trust (a proxy for social networks)**. Political polarization can be a consequence of social interactions and discussions. An individual's opinion about a particular party or policy can be affected by the opinions of his or her neighbors, relatives, or friends. Axelrod (1997), Baldassarri and Bearman (2007), and Iversen and Soskice (2015), among others, study the role of social networks in political polarization. As a proxy of social networks, we use the measure of trust in the country, computed as the inverse of the average value of the responses to the statement "Most people can be trusted" ("yes" is counted as 1, "no" is counted as 2) for each country and wave in the WVS survey. Data source: WVS.

8. **Democracy**. Democratic societies have more freedom in defining, discussing, and adjusting their political attitudes. As a measure of democracy in the country, we use the Freedom House indicator, which ranges from 0 to 10 where 0 is the least democratic and 10 is the most democratic. Data source: Freedom House.

Table 1
Summary statistics.

Variable	Mean	SD	Correlation with:		
			GOV	ININ	PRST
Polarization measures					
GOV	2.810	0.363	1.000		
ININ	2.799	0.364	0.755	1.000	
PRST	2.684	0.441	0.831	0.836	1.000
Time-invariant variables					
Fractionalization	0.132	0.149	0.267	0.263	0.322
Absolute latitude	0.378	0.181	−0.534	−0.391	−0.435
Time-varying variables					
Media status	1.780	0.777	0.243	0.325	0.466
Trust	0.575	0.055	−0.465	−0.455	−0.556
Income inequality	37.409	9.359	0.605	0.568	0.572
FDI (% of GDP)	17.600	16.921	−0.325	−0.222	−0.287
Gov. Exp. (% of GDP)	15.422	5.104	−0.578	−0.351	−0.420
Real GDP (Ln)	8.451	1.491	−0.403	−0.386	−0.620
Pop. density	115.377	142.105	0.098	−0.071	0.045
Democracy	7.539	2.553	−0.174	−0.291	−0.408

[1] Other authors relied on the political polarization measures constructed from surveys; see, for example, Alt and Lassen (2006), Lindqvist and Östling (2010), and Iversen and Soskice (2015).

Geographic determinants

9. **Population density**. This variable can influence the quantity and quality of communications among a country's citizens (social networks), if face-to-face communication is preferred to phone or the internet. Data source: World Bank.

10. **Absolute latitude**. This variable is a proxy for a country's geographic factors. Together with ethnolinguistic fractionalization, this time-invariant factor accounts for unobserved country heterogeneity. Data source: World Bank.

Table 1 reports the descriptive statistics for all listed explanatory variables.

3. Methodology

We identify the underlying factors that explain the political polarization by using a BMA approach[2] to account for model uncertainty. We consider a linear regression model:

$$y = \beta_0 + \beta \mathbf{X} + \varepsilon, \tag{1}$$

where y is the measure of political polarization and a set of its potential determinants is denoted by $\mathbf{X}$. We have ten potential regressors described in Section 2.2. The BMA estimates models, M_j, for all possible combinations of the regressors, $j = 1, \ldots, 2^{10}$, and determines the models with the highest likelihood. The probability that M_j is the "true" model given the data, $\Pr(M_j|D)$, is the ratio of its marginal likelihood to the sum of marginal likelihoods over the entire model space:

$$\Pr(M_j|D) = \Pr(D|M_j)\Pr(M_j) \Big/ \left(\sum_{i=1}^{2^{10}} \Pr(D|M_i)\Pr(M_i) \right), \tag{2}$$

where

$$\Pr(D|M_j) = \int \Pr\left(D|\beta^j, M_j\right) \Pr\left(\beta^j|M_j\right) d\beta^j, \tag{3}$$

and β^j is the vector of parameters from model M_j, $Pr(\beta^j|M_j)$ is a prior probability distribution assigned to the parameters of model M_j, and $\Pr(M_j)$ is the prior probability that M_j is the true model. The posterior inclusion probability (PIP) is the probability that a particular variable h belongs to the true model:

$$\Pr(\beta_h \neq 0|D) = \sum_{j:\beta_h \in M_j, \beta_h \neq 0} \Pr\left(M_j|D\right). \tag{4}$$

The estimated posterior means and variance of $\hat{\beta} = (\hat{\beta}_1, \ldots, \hat{\beta}_{10})$ are constructed as

$$E(\hat{\beta}|D) = \sum_{i=1}^{2^{10}} \hat{\beta} \Pr\left(M_i|D\right), \tag{5}$$

$$\mathrm{Var}(\hat{\beta}|D) = \sum_{i=1}^{2^{10}} \left(\mathrm{Var}(\hat{\beta}|D, M_i) + \hat{\beta}^2 \right) \Pr\left(M_i|D\right) - E\left(\hat{\beta}|D\right)^2. \tag{6}$$

For the implementation of the BMA methodology, we try a number of different priors on the parameter space and on the model space. We report the results for uniform prior on the model space and "hyper-g" prior on the parameter space, although our conclusions are robust to different specifications of the priors.[3]

We consider cross-section and panel data separately. The cross-section data include 66 countries, one observation for each country, annual data for years in the range 1990–2013. When more than one survey wave is available for a particular country, we consider the data from the most recent survey. The dependent variable is the measure of political polarization in country–year. The time-varying economic explanatory variables are the averages over five-year periods (to smooth the effect of economic fluctuations) starting from the year preceding the survey.

In order to explore the availability of the data and increase the number of observations and the information set, we also consider unbalanced panel data for 66 countries, 1–5 observations per country (survey waves). We capture unobserved heterogeneity across countries using the absolute latitude and ethnolinguistic fractionalization measures. In order to capture unobserved common factors across countries we use cross-sectionally de-meaned data (by subtracting from each observation the mean of the variable across the countries for every time period). For the panel model, we use the lags of the regressors which are not from the survey (to mitigate simultaneity and to account for the lag between the moment when the survey was conducted and the economic conditions were recorded).

4. Results

The results of the cross-section and panel estimates, presented in Table 2, suggest that the most robust determinants of political polarization (which have the highest PIP across all political polarization measures) are trust and income inequality. The only exception is the panel estimates for the PRST polarization measure where real GDP and trust constitute robust determinants of polarization ($PIP = 0.9770$ and 0.9888, respectively), while income inequality has a PIP of 0.5049 (implying weak evidence for a regressor). Higher trust reduces polarization, and higher inequality increases polarization, for all polarization measures. In particular, an increase in our measure of trust by one standard deviation decreases political polarization by approximately 0.17–0.40 standard deviations, on average, and an increase in income inequality by one standard deviation increases political polarization by 0.09–0.36 standard deviations, on average, with exact effects depending on the polarization measure.

For the political polarization measure that reflects the attitude to the size of the government, GOV, the government expenditure is another robust determinant. A larger government reduces disagreement in a society about how large the government expenditures should be. This can be, at least partially, because fewer people might prefer an increase in the size of government if the current size of government is large (see Lindqvist and Östling, 2010). This points to a possible shortcoming of the polarization measures used: The attitude toward a particular policy can be influenced by the existing status of that policy.

The remaining variables have a low PIP and insignificant coefficients, implying that there is insufficient evidence to consider these variables as regressors.

The results from Table 2 indicate the robust correlates of the political polarization measures. We cannot claim any causal relationship between these determinants and political polarization, because of reverse causality. As a robustness test, we estimate a pooled OLS model including trust or income inequality and their interactions with a dummy for democracy as explanatory variables. If polarization affects income inequality or trust level in the society, its correlation with these variables should be stronger in democratic societies where voters have more influence on political outcomes. The results presented in Table 3 suggest that the relationship between political polarization and income inequality or trust is not significantly affected by the degree of democracy, supporting the view that income inequality and trust affect polarization.

[2] Moral-Benito (2012) describes the use of BMA in detail.

[3] See Zeugner and Feldkircher (2009) on advantages of "hyper-g" prior.

Table 2
The determinants of political polarization: cross-section and panel estimates.

Variable	(1) GOV	(2) ININ	(3) PRST	(4) GOV	(5) ININ	(6) PRST
Trust	**0.8835**	**0.9588**	**0.9794**	**0.8765**	**0.9087**	**0.9888**
	−1.6483	−2.3735	−3.2041	−1.1491	−1.3941	−2.2349
	0.8807	0.9495	1.0765	0.6285	0.6963	0.6758
Income inequality	**0.9691**	**0.8973**	**0.8874**	**0.9270**	**0.9777**	0.5049
	0.0141	0.0114	0.0139	0.0097	0.0125	0.0041
	0.0051	0.0060	0.0074	0.0044	0.0045	0.0053
Real GDP	0.2812	0.3997	0.5613	0.1803	0.2226	**0.9770**
	0.0081	0.0176	−0.0388	−0.0013	0.0007	−0.1115
	0.0199	0.0329	0.0445	0.0112	0.0152	0.0376
Gov. Exp. (% of GDP)	**0.9796**	0.2631	0.3321	**0.9977**	0.2671	0.3635
	−0.0223	−0.0009	−0.0038	−0.0209	−0.0014	−0.0034
	0.0075	0.0045	0.0077	0.0053	0.0039	0.0060
Media status	0.4558	0.2674	0.2042	0.2482	0.7075	0.5504
	−0.0354	−0.0061	−0.0012	0.0135	0.0707	0.0717
	0.0504	0.0372	0.0339	0.0400	0.0626	0.0864
Absolute latitude	0.1925	0.2617	0.2385	0.2502	0.2714	0.2645
	−0.0140	0.0062	0.0457	−0.0510	0.0517	0.0701
	0.1174	0.1517	0.1906	0.1381	0.1442	0.1795
Fractionalization	0.1789	0.2428	0.2088	0.5488	0.3606	0.7599
	0.0074	0.0131	0.0267	0.1699	0.0859	0.3621
	0.0823	0.1129	0.1287	0.1948	0.1588	0.2686
FDI (% of GDP)	0.1837	0.3336	0.2452	0.2000	0.3132	0.4379
	0.0000	0.0008	0.0006	−0.0002	0.0007	0.0017
	0.0010	0.0019	0.0019	0.0009	0.0015	0.0024
Democracy	0.2150	0.4596	0.2925	0.3059	0.2789	0.3383
	0.0010	−0.0138	−0.0064	0.0062	0.0012	0.0108
	0.0093	0.0213	0.0166	0.0137	0.0124	0.0217
Pop. density	0.1867	0.2714	0.1947	0.1790	0.2669	0.1803
	−0.0000	−0.0000	0.0000	0.0000	−0.0000	−0.0000
	0.0001	0.0002	0.0001	0.0001	0.0001	0.0001
Number of obs.	66	66	66	133	133	133

The table reports the BMA results with uniform model prior and "hyper-g" prior. The title of each column indicates the dependent variable. Columns (1)–(3) present cross-section estimates; Columns (4)–(6) present panel estimates. For cross-section estimates time-varying economic explanatory variables are averages over five years, $t-1$ to $t-5$. For each explanatory variable, each column contains results in the following order: posterior inclusion probability (PIP), posterior mean, and standard deviation. PIP indicates evidence for a regressor: 0.50–0.75—weak, 0.75–0.95 positive, 0.95–1.00 strong evidence (Raftery, 1995). PIPs higher than 0.8 are presented in bold.

Table 3
The determinants of political polarization and the role of democracy.

Variables	(1) GOV	(2) GOV	(3) ININ	(4) ININ	(5) PRST	(6) PRST
Trust	−3.289***		−3.058**		−3.517**	
	(1.138)		(1.526)		(1.610)	
Income inequality		0.019***		0.018***		0.019***
		(0.004)		(0.006)		(0.007)
Trust * Democratic	1.643		1.706		1.561	
	(1.321)		(1.626)		(1.734)	
Democratic	−1.134	−0.029	−1.210	−0.029	−1.311	−0.004
	(0.753)	(0.277)	(0.913)	(0.298)	(0.977)	(0.365)
Income inequality * Democratic		−0.004		−0.004		−0.013
		(0.008)		(0.009)		(0.010)
Constant	5.048***	2.563***	4.442***	2.120***	5.057***	2.415***
	(0.688)	(0.115)	(0.922)	(0.148)	(0.973)	(0.178)
Year dummy	YES	YES	YES	YES	YES	YES
Observations	159	140	159	140	159	140
R-squared	0.413	0.486	0.387	0.422	0.509	0.509

The results are obtained using OLS. The title of each column indicates the dependent variable. Democratic = 1 if the Freedom House measure of democracy = 10. Robust standard errors in parentheses.
* $p < 0.1$.
** $p < 0.05$.
*** $p < 0.01$.

5. Conclusions

The results of this study suggest that the most robust determinants of political polarization in a society are trust and income inequality. Higher trust in people and lower income inequality reduce political polarization. Government expenditures and real GDP appear to be the other significant factors that reduce political polarization in a country. We conclude that political polarization is a socio-historical and an economic phenomenon.

Acknowledgments

I am very grateful to an anonymous referee and to Lorenzo Ductor for useful comments.

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